GARDEN AND FOREST.

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TABLE OF CONTENTS.

PAGE.

EDITORIAL ARTICLES:—The Revised Plan for Jackson Park, Chicago. (With maps.) 201
Shrubs, Native and Foreign 202
Product of White Pine per Acre ..... *B. E. Fernow.* 202
FOREIGN CORRESPONDENCE:—Bamboos in English Gardens ..... *W. Watson.* 206
CULTURAL DEPARTMENT:—The Hubbard Squash and How to Grow It. *Will W. Tracy.* 207
The Rock Garden ..... *T. D. Hatfield.* 207
Notes from the Arnold Arboretum ..... *Jackson Dawson.* 208
Flower Garden Notes ..... *E. O. Orpet.* 208
Carex Japonica variegata, Allium Magarithanicum ..... *J. N. G.* 209
CORRESPONDENCE:—Why do Blossom-buds Winter-kill? ..... *G. W. McClunt.* 209
A Destructive Scale in the Marquesas Islands. *Professor T. D. A. Cockerell.* 209
RECENT PUBLICATIONS 209
NOTES 210
ILLUSTRATIONS:—General Plan World's Columbian Exposition 204
Revised Plan for Jackson Park, Chicago 205

The Revised Plan for Jackson Park, Chicago.

AT the exhibition of the Architectural League, held in this city last winter, there was a plan for the improvement of Jackson Park, Chicago, prepared by Messrs. Olmsted, Olmsted & Eliot, of which we spoke at the time, and we have since then secured a reduced sketch, which we present to our readers on page 205, although, of course, many of the finer details are not evident as they were in the original. On page 204 we present for comparison the plan for the World's Fair site, which covered the same area, and if we had space it would be interesting to republish a copy of the original plan of Jackson Park, made in 1871 by Olmsted, Vaux & Co., and which contained many of the fundamental ideas which were developed in the later creations. The plan of the World's Fair grounds, on page 204, was originally published in volume v., page 291, of this journal, and the description then given would be found of interest in connection with the present design. The elements of the scenery of the park are: (1) the broad view of Lake Michigan commanded from the Shore Drive and the Concourse on Sunrise Bluff; (2) the spacious fields between the lagoons and the lake and between the lagoons and the south-west entrance, each presenting broad, quiet landscapes of the simplest pastoral sort, which are pleasingly commanded from the adjacent drives and walks; (3) the lagoons, with their intricate and bushy shore-lines, their beaches and bridges, their almost complete seclusion, with a scenery in strong contrast to that of the lake-shore and fields—scenery which can be enjoyed not only from the shore, but particularly from the boats.

The decision to retain the Art Building of the World's Fair for the Field Columbian Museum made it necessary to revise all the road-lines, together with the walks which had been designed for the original park and some of those which had been retained during the Fair, so that the surroundings of the great building should be in harmony with it. The Circuit Drive is now symmetrical to the right and left of the north and south axis of the Museum, and the straight road across the north front has been moved farther away. The pond south of the buildings is to be reconstructed into a symmetrical basin with architectural outlines, and since the character of the planting on the margins of the lagoons will make them unsuitable for skating and will not permit the public to walk along the water margin, the Museum Basin provides for a broad walk a foot above the water-level, so that the basin can be used for sailing toy-boats and skating. In connection with these dominating architectural works provision has been made for considerable decorative planting of a formal kind. The large conservatory which it had been determined to build in Washington Park has been appropriately placed in the formal grounds about the Museum, where it will not be in view from any important part of the building and where the differences in the style of architecture of the two will not be unpleasantly obvious.

The North Haven and Wooded Island will remain substantially as they were during the Fair, although the shore of the lagoon is to be more varied with islands and bays. The west shore of the west lagoon, where the water seemed too narrow, will be carried a little farther to the west. The south end of this lagoon will be widened and extended, leaving a long and narrow island where the Electricity Building stood. The sites of the Government Building and Manufacturers' Building will be turned into slightly undulating meadow, which will be used for tennis and other lawn games. The Grand Basin in the Court of Honor will have its outline changed into irregular forms, and it will become the northern end of the South Lagoon and the Middle Bay. The view from the West Lagoon Drive is mainly to the eastward over to the lagoon, and therefore the space between the drive and the west boundary of the park would be of comparatively small landscape value, except as affording a screen of foliage against the city, and therefore two athletic grounds have been planned here, one for men and one for women, and a smaller space for small children and infants, with suitable buildings, on the general lines of similar grounds in Charlesbank, Boston, which have proved very successful.

In the south-west corner of the park will be a sixty-acre field with a slightly rolling surface, which will not only have great value as a piece of landscape, but may be used for field games of all kinds. It will be restricted, however, to the use of boys and girls of grammar-school age, not only to diminsh the wear of the turf, but to lessen the danger to visitors by stray balls, which would be more dangerous if thrown or batted by men. For the first time a special provision for bicycles has been made in the shape of a path around the ball-field, with a large stand, surrounded by shade-trees, for refreshments and the social reunions that are apt to take place. This bicycle-path is not for speeding, but for such promenading as is provided for equestrians in London at Rotten Row. A bridle-path also makes a complete circuit of the path south of the Columbian Basin.

The point of land between South Haven and the lake is to be treated as a wild, wind-swept series of dunes. The ground will have the form of dunes and will be planted on the slopes toward the lake with Beach Grasses and Sedges, Beach Pea, low shrubs and other perennials. Back of the dunes Red Cedars, Prostrate Junipers, Beach Plums and other bushes appropriate to sand dunes will be grown with Beach Pine and other native Pines on the lee or western side of the highest bluff, of which advantage is to be taken to afford a commanding view for persons in carriages, as the Concourse at this point will rise to a height of twenty-five feet above the lake. The University of Chicago having developed since the original plan was made, and being situated on the north side of the Midway Plaisance, an opportunity has been provided here for boat-racing and boating carnivals, and the series of basins connected by narrow canals in the original plan has been changed to a canal uniformly a hundred feet wide and long enough for a mile race. The bridges to carry streets across the canal will have a hundred-foot span, so as to offer no obstruction to navigation. A broad walk on either side of the

canal affords facilities for thousands of people to view the races and carnivals without danger of damaging the grounds. Since the lagoons in the park are entirely unsuitable for racing or other spectacles which would cause great crowds to assemble on the shores, this will afford opportunity for wholesome sport without danger to delicate natural planting.

A mound from six to eight feet high, with a comparatively gentle slope all round the north, west and south sides of the park, is to be constructed for the purpose of concealing the city streets even in winter, and to reflect back as much as possible the noise of city traffic. These mounds are to be covered by trees, spaced sufficiently far apart to permit them to grow low branches, and dense shrubbery plantations will be grown outside of them and under them.

This is the plan in general outline, but we have omitted mention of the facilities for boating and yachting and many provisions for public accommodation apart from those which directly help to the enjoyment of the landscape. There are an unusual number of such introductions, and the skill of the architect is shown by placing these, not only so that they will do as little damage as possible to the turf and the plantations, but in such a way that they will not injure the beauty of the prospects and will interfere as little as possible with visitors who come to the park for the enjoyment of the landscape, for quiet and for secluded recreation. Besides the structures we have mentioned, like the conservatory, the museum and the like, we might name the picnic shelter at the north-east corner of the park, the Germania restaurant, the bath-house, the music court, the various field houses connected with gymnasium grounds for men and women, with the tennis lawns and ball ground, the Japanese temple, the casino, the service yards and administration buildings, the life-saving station, the Belvedere, with numerous shelters, boat-houses and landings, carriage-sheds and many other artificial works which by their nature detract from the beauty of the landscape, but which all have been concealed by grading or subdued by foliage. That is, in preparing all these attractions and conveniences the primary purpose of the park has never been lost sight of. The landscape is the essence of the park. The green pastures and still waters—pictures of peace—the outlook over the great inland sea, all the commanding charm of the place, has been preserved and heightened for the refreshment of city-wearied senses. A study of the map is like a visit to the country. One can plainly trace long lines of view which offer every advantage for enjoying the scenery. There are scores of these vistas, and they control the outline of the lagoons and islands, the grading and alignment of the roads and walks and the shape and character of the plantations. Some of them are purely natural and others are directed to bridges or buildings, which, of course, will be carefully designed. Especial attention is called to the extension of the south lagoon which lengthens the charming view through the middle of the park lengthwise of the lagoons, with the Belvedere at the southern boundary of the park as an objective point for the long vista from the north end of the east lagoon.

Shrubs, Native and Foreign.

THE uncertainties of gardening are apparent this spring in the neighborhood of Boston, where many shrubs, usually considered perfectly hardy, have suffered during the past severe winter, which has left others, that might have been expected to have suffered, untouched. All the species of Forsythia, usually remarkable for the profusion of their flowers, have practically been flowerless this spring, although their wood is uninjured. The Japanese Weeping Cherries, Prunus pendula and Prunus Miqueliana, which have usually been considered perfectly reliable, have lost all their flower-buds. Ordinary Cherry-trees have been nearly flowerless, and Pear-trees promise but a scanty crop of fruit. Spiræa Thunbergi has lost, as usual, the tips of its branches and most of its flower-buds, and the Wistarias are without flowers. Well-established plants of Deutzia Sieboldiana are in many cases killed to the ground, and Deutzia gracilis has lost more of its wood than usual.

On the other hand, Ghent Azaleas, which frequently lose their flower-buds in severe winters, promise this season an exceptionally large crop of flowers. Rhododendrons of the Catawbiense type are uninjured in foliage and flower-buds, and conifers generally are in better condition than usual at this time of the year. Apple-trees are covered with bloom, and all the various Japanese, Chinese and Siberian Crabs are covered with flowers. The Japanese Pyrus Toringo and its lovely double-flowered variety, Pyrus Parkmanni, have never been more beautiful, and the value of these plants in decorative planting has never appeared greater than it has this spring. All the Magnolias of the Yunan section, with the exception of Magnolia Kobus, which still remains flowerless, have bloomed profusely, and have this season been unusually satisfactory, as the flowers have been untouched by frost or rain. All the varieties of the common Lilac are as full of flower-buds as usual, and Syringa pubescens is uninjured, and in a few days will cover itself with its charming fragrant flowers. The flower-buds, however, of Syringa oblata of northern China have been greatly injured, although the semi-double flowered hybrid of this plant, with Syringa vulgaris, has escaped injury. This is the earliest of all Lilacs to bloom, and for this reason, although the flower-clusters are not large, it is a desirable plant. Cornus florida, which in the latitude of Boston often loses its flower-buds in severe winters, is uninjured this year; and the severity of the winter has made no impression on the flower-buds of the American Judas-tree, Cercis Canadensis. The bush Honeysuckles are all uninjured, and native Viburnums, Roses and Cornels will bloom as usual.

A winter like the last one emphasizes the fact, if it needs emphasis, that our native shrubs are best suited for our climate, and that foreign plants, however hardy they are usually, are more liable to suffer than native species. Many exotic shrubs, even those which are considered the hardiest, are disfigured in spring by dead branches, and when such shrubs are used in great numbers, as they have been in the Boston parks, the labor of cutting out the dead wood is so great that it is rarely attended to, and shrubberies present a shabby appearance all summer. Our native shrubs, of course, die sometimes during severe winters or lose part of their branches, but, as a rule, they are in better condition after a hard winter than any of the exotic species, and with each succeeding season we feel more and more convinced that for planting on the large scale which must be practiced in public parks, or on large private estates, the most satisfactory material will be drawn from the native flora.

Product of White Pine per Acre.

ONE of the elements that need to be known in order to discuss the profitableness of forestry is the amount of useful wood which can be produced per acre. On this point the most erroneous and extravagant notions exist, and many calculations are made on paper which can never be realized. The rate of growth of a tree at a given age is supposed to continue indefinitely, and this rate is applied to an acre of trees, the number per acre being guessed high enough to make a good showing, and then the total amount of wood, or at least a large percentage of it, is supposed to be usable, and thus we can compute astonishing yields for the future.

The latest contribution to these rosy prospects is contained in an article by Mr. Edward Hersey, Superintendent on the Bussey Farm, near Boston, on the value of the White Pine as a timber-tree, which, besides several surprising statements regarding the felling time for Pine, contains the following:

Careful measurements and estimates of the product of many acres of Pine timber in Plymouth County, Massachusetts, have led me to the conclusion that where there is no other timber

mixed with the Pine, on a warm, loamy soil, in a growth of from thirty to thirty-five years, one hundred thousand feet of box-boards may be obtained; but on an average soil the usual thirty years' growth has been found to be about fifty thousand feet, when but little other wood is mixed with it. The expense of cutting, drawing, sawing and drying is from $5.00 to $6.00 per thousand feet, which, at the present price of box-boards, would leave the owner of the land about $2.50 per thousand on the stump, or $125.00 per acre. This sum would pay a good interest on the investment if the land had cost not more than $15.00 per acre when the Pines first started to grow.

Supposedly, the writer, when speaking of feet, does not refer to the usual unit of board measure, but to the superficial foot with a five-eighth-inch thickness to which box-boards are usually cut. Translating his measure, therefore, to the generally accepted board measure, the 100,000 and 50,000 feet represent 62,000 and 31,000 feet, B. M., respectively. These amounts he claims can be grown in thirty to thirty-five years.

To simplify further, we may translate this measure into cubic feet of forest-grown material. It is well known that in sawing there is a necessary waste in sawdust and slab amounting, according to the diameter of the log, to from twenty to seventy-five per cent.—the smaller loss on large, the larger loss on small logs. A straight log ten inches across at the smaller end and ten feet long will waste sixty-five per cent. in common mill practice—that is to say, of the 5.4 cubic feet of wood in the log 3.5 feet are lost, and only 1.9 cubic feet reappear in the boards as they fall from the saw. In other words, to produce one thousand feet, B. M., one needs to have, not eighty-three (that is 1,000÷12) cubic feet of log, but 240 cubic feet.

Since in growths of from thirty to sixty years the amount of ten-inch log material forms only a small part, the wastage on the average would be considerably greater. Yet, to throw the advantage altogether to the other side, we will not only admit no larger wastage, but in addition assume that all the wood from base to top can be utilized, although the useless tops will in reality average, according to size, from ten to fifty per cent. and more of the total growth of wood per acre. We would then require for Mr. Hersey's claim 7,400 cubic feet of wood on the acre for the smaller and twice that amount for the larger output, claimed by him as possible, at from thirty to thirty-five years of age. Although the White Pine is among our best producers, both these figures are absurdities, into which the writer has probably fallen by underestimating the age of the growths which he measured. The Division of Forestry has during the last two years made careful and accurate measurements of many acres and some five hundred sample trees of varying age from various conditions, which go to show that these estimates are from fifty to a hundred per cent. too great. Unfortunately, not a sufficient number of acre yields of the age of thirty to thirty-five years has been measured to permit their use for argument, but it will suffice to show that groves of forty and fifty years of age do not produce the amounts claimed, and that it would require a good stand of sixty to seventy years' growth and more to produce anything like the larger figure of 14,800 cubic feet.

It so happens that among the acres measured there were three from three localities in Plymouth County, Massachusetts, the very region to which Mr. Hersey refers. Their record is as follows:

No.	Age.	All the trees over 3 inches.		All the trees over 6 inches.		All the trees over 10 inches.	
		Number.	Volume.	Number.	Volume.	Number.	Volume.
1	52	328	6,559	313	6,517	182	5,064
2	50	415	5,479	346	5,279	116	2,681
3	45	475	5,831	376	5,545	136	3,111

All three stands were considered well stocked. The last one is of special interest, as it originated by sowing a piece of pasture (seventeen acres) to Pine just forty-five years before it was measured, and was considered specially well stocked; the owner claimed to have cut fifty cords to the acre, which he calculated equal to 30,000 feet, board measure, a rather incredible result, even when the total volume of the trees over six inches is supposed to yield box-boards.

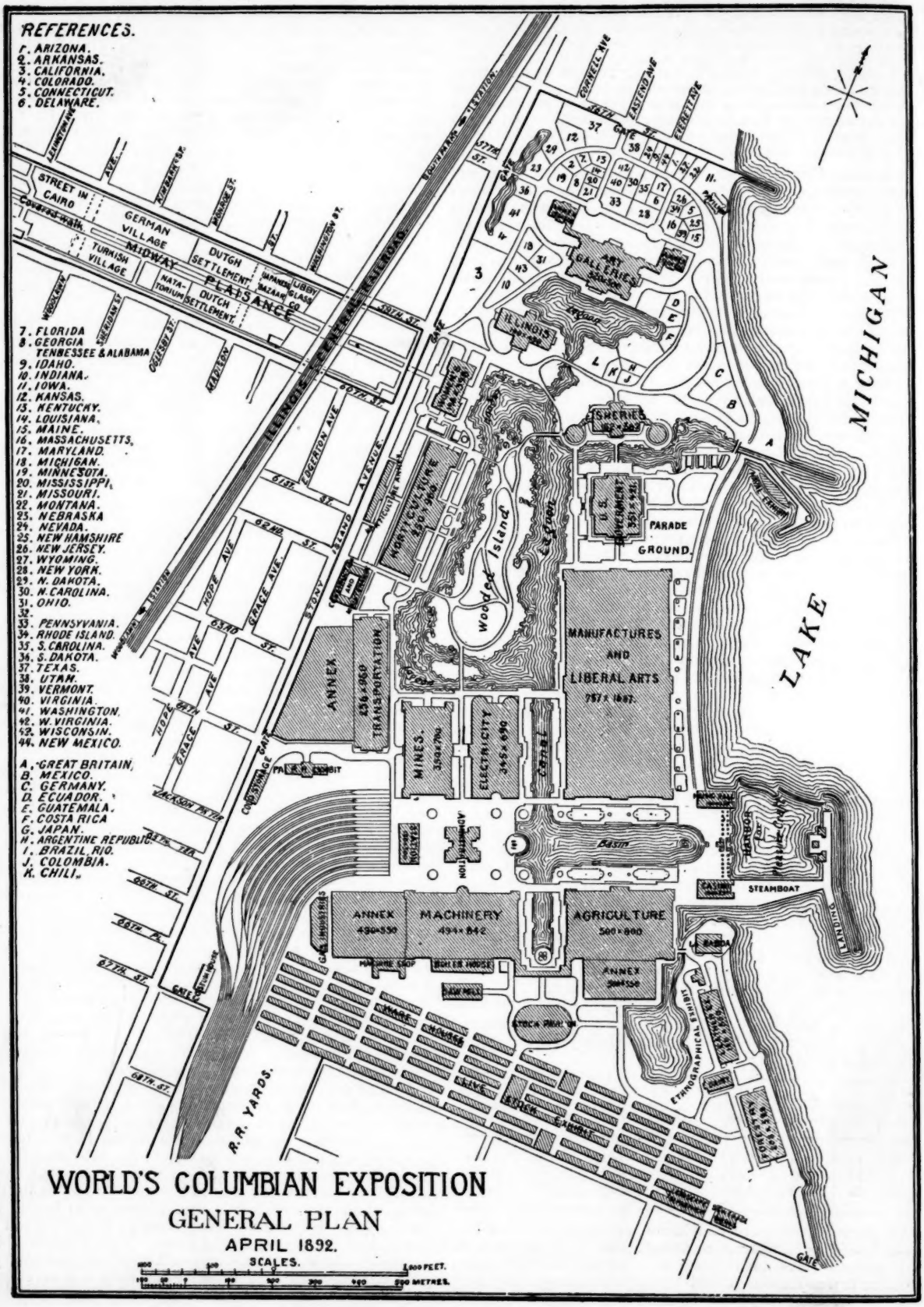
Even if we admit the entire wood production of trees over three inches in diameter on the best acre given above amounting to 6,559 cubic feet to cut box-boards, this would fall short by twelve per cent. of Mr. Hersey's figure, although the trees were twenty years older. In reality, only the trees over ten inches, or eight at best, could be cut even into box-boards. The best average production of wood per year per acre (all included) during the first fifty years appears to be round 150 cubic feet, which for the age of thirty-five years would make the yield 5,250, of which less than one-half might be fit even for box-boards, and 15,000 feet, board measure, would be quite a remarkable result. The acres of thirty to thirty-five years measured, which, however, we do not consider good, cut fifty per cent. less.

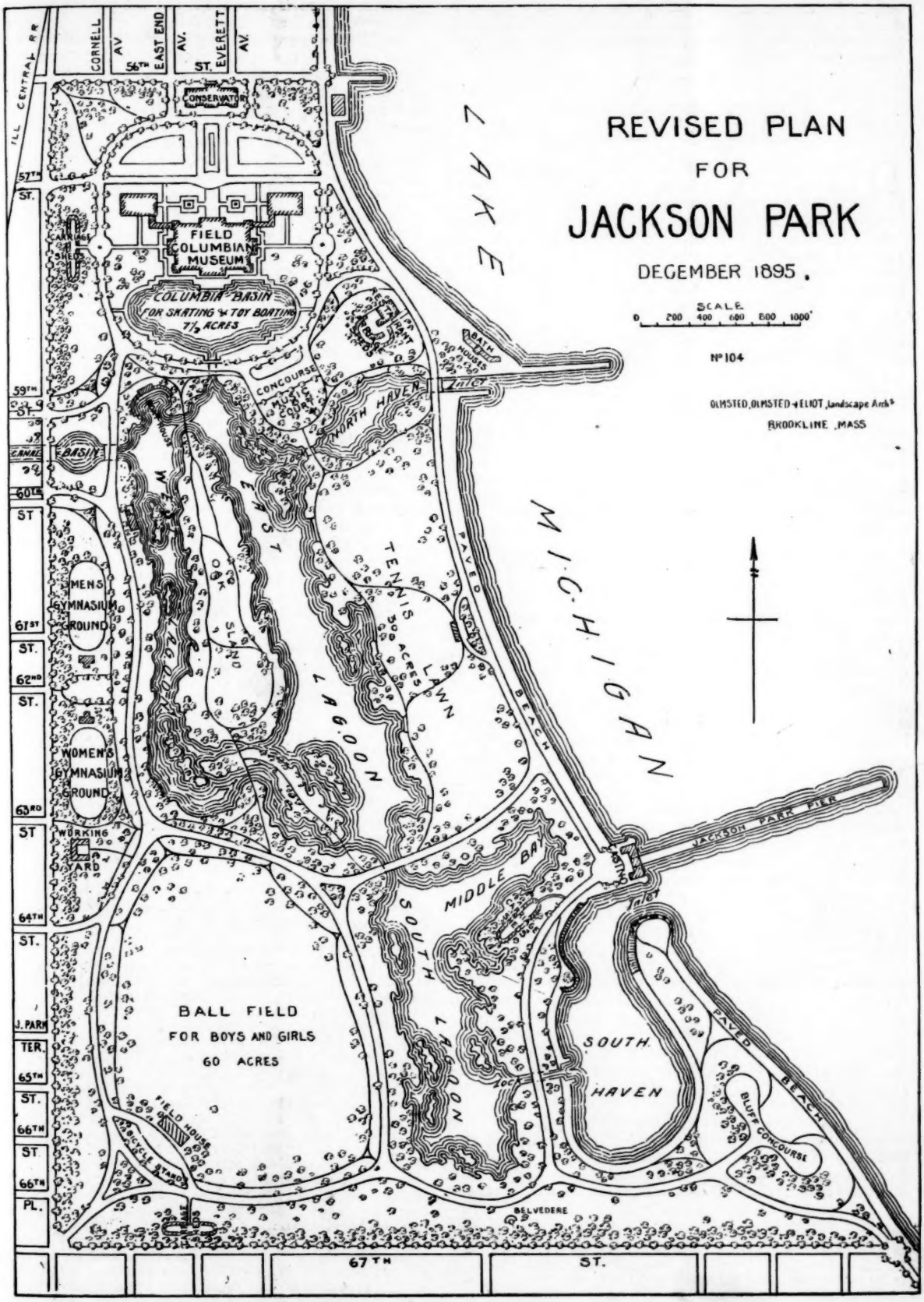
In growths forty years old, of which we have a number measured, there will be 400 to 500 trees, in the average about 425 to the acre. According to the greater or less number the diameter classes vary; no trees will have reached a diameter over eighteen inches, and only few, not more than twenty-five to thirty at best, over fourteen inches, the majority falling in the diameter class of six to ten inches, and the number between ten and fourteen inches is rarely over 150, the total volume varying between 4,000 and 6,000 feet per acre. At best 20,000 feet, board measure, may be cut, more likely much less.

There is no doubt that by judicious thinning at the right time and in the proper manner the yield could be increased, but not even with the best practice would this increase amount to more than twenty-five or thirty per cent., individual development rather than increase of total yield in the final harvest being the object of the thinnings.

Mr. J. D. Lyman, of New Hampshire, has a growth of White Pine two-thirds of an acre in extent, fifty to fifty-five years of age, which he has thinned so that in 1894 only 146 trees remained, or 223 to the acre. As a result a very considerable development of the individual trees is noticeable, but not much in the total volume per acre. Most of his trees are over ten inches in diameter, at least sixteen of them are over fourteen inches, and the best measured 22.2 inches, the height being seventy to eighty feet. The calculated volume corresponds to a production of 7,185 cubic feet of wood an acre, which under very careful practice might cut 30,000 feet, board measure. The best forest-grown tree, fifty-four years of age, which we have found standing on this ground was eighty feet high, with a diameter at base of eighteen inches, and a diameter of four inches at sixty-five feet, containing altogether seventy-two cubic feet of wood, sixty-five of which were capable of being cut into lumber. This tree at thirty years of age was only 10.8 inches in diameter; at forty years fourteen inches, and the four-inch top diameter was then at about fifty-five and sixty feet respectively. If we assumed it possible to have 300 such trees standing on an acre, which would be twelve feet each way, the total amount of wood at fifty-four years would be 21,600 cubic feet, of which 19,500 would make lumber cutting, say, round 100,000 feet, board measure. This would be an ideal stand, which general practice can hardly hope to attain.

In all the above calculations it must not be overlooked that we have made reference only to box-boards—that is, the lowest quality of boards, extremely knotty. If the object were to grow saw-timber with the largest amount of clear material the results would be entirely different, since that would require the growing of a much larger number of trees per acre until the twenty-fifth or thirtieth year, when the individuals would develop in length and by the close stand clear each other of branches, but the diameter development would suffer. Then they should be thinned to develop diameter, but it would be necessary to give considerable time before good sizes are developed;


REFERENCES.
1. ARIZONA.
2. ARKANSAS.
3. CALIFORNIA.
4. COLORADO.
5. CONNECTICUT.
6. DELAWARE.
7. FLORIDA
8. GEORGIA
TENBESSEE & ALABAMA
9. IDAHO.
10. INDIANA.
11. IOWA.
12. KANSAS.
13. KENTUCKY.
14. LOUISIANA.
15. MAINE.
16. MASSACHUSETTS.
17. MARYLAND.
18. MICHIGAN.
19. MINNESOTA.
20. MISSISSIPPI.
21. MISSOURI.
22. MONTANA.
23. NEBRASKA
24. NEVADA.
25. NEW HAMSHIRE
26. NEW JERSEY.
27. WYOMING.
28. NEW YORK.
29. N. DAKOTA.
30. N. CAROLINA.
31. OHIO.
32.
33. PENNSYVANIA.
34. RHODE ISLAND.
35. S. CAROLINA.
36. S. DAKOTA.
37. TEXAS.
38. UTAH.
39. VERMONT.
40. VIRGINIA.
41. WASHINGTON.
42. W. VIRGINIA.
43. WISCONSIN.
44. NEW MEXICO.
A. GREAT BRITAIN.
B. MEXICO.
C. GERMANY.
D. ECUADOR.
E. GUATEMALA.
F. COSTA RICA
G. JAPAN.
H. ARGENTINE REPUBLIC
I. BRAZIL RIO.
J. COLOMBIA.
K. CHILI.
STREET IN CAIRO
GERMAN VILLAGE
MIDWAY
TURKISH VILLAGE
DUTCH SETTLEMENT
PLAISANCE
JAPANESE BAZAAR
LIBBY GLASS CO
NATATORIUM
DUTCH SETTLEMENT
ILLINOIS CENTRAL R.R.
ILLINOIS
63RD ST.
64TH ST.
65TH ST.
66TH ST.
67TH ST.
68TH ST.
69TH ST.
ESCANABA AVE
HOPE AVE
GRACE AVE
STONY ISLAND AVENUE
WOODLAWN
KENWOOD
HYDE PARK
GREENWOOD
DREXEL
KIMBARK
CORNELL AVE
EASTLAKE TERRACE
ART GALLERIES
ILLINOIS
FISHERIES
HORTICULTURE
WOODED ISLAND
LAGOON
U.S. GOVERNMENT
PARADE GROUND
MANUFACTURES AND LIBERAL ARTS
757 × 1687.
ANNEX
TRANSPORTATION
MINES.
ELECTRICITY
CANAL
BASIN
HARBOR
STEAMBOAT
ANNEX
MACHINERY
AGRICULTURE
500 × 800
ANNEX
HORTICULTURAL BUILDING
ETHNOGRAPHICAL EXHIBITS
R.R. YARDS.
LAKE MICHIGAN
WORLD'S COLUMBIAN EXPOSITION
GENERAL PLAN
APRIL 1892.
SCALES.
1000 FEET.
300 METRES.


REVISED PLAN
FOR
JACKSON PARK
DECEMBER 1895.
SCALE
0 200 400 600 800 1000'
Nº 104
OLMSTED, OLMSTED + ELIOT, Landscape Archts
BROOKLINE, MASS
LAKE MICHIGAN
CORNELL AV.
56TH ST.
EAST END AV.
EVERETT AV.
ILL. CENTRAL R.R.
CONSERVATORY
FIELD COLUMBIAN MUSEUM
COLUMBIA BASIN FOR SKATING & TOY BOATING 7½ ACRES
CONCOURSE
MUSIC COURT
NORTH HAVEN
BATH HOUSES
57TH ST.
59TH ST.
CANAL
BASIN
60TH ST.
67TH ST.
MEN'S GYMNASIUM GROUND
62ND ST.
WOMEN'S GYMNASIUM GROUND
63RD ST.
WORKING YARD
64TH ST.
J. PARK TER.
65TH ST.
66TH ST.
PL.
WEST LAWN
OAK
SLOPE
TENNIS LAWN
300 ACRES
LAGOON
PAVED CONCOURSE
BEACH
JACKSON PARK PIER
INLET
MIDDLE BAR
SOUTH LAGOON
SOUTH HAVEN
PAVED BEACH
BLUFF CONCOURSE
BALL FIELD
FOR BOYS AND GIRLS
60 ACRES
FIELD HOUSE
BICYCLE STAND
BELVEDERE
67TH ST.

before the trees are 90 or 100 years it would not pay to cut them, and then 100,000 feet, not of common box-boards but of good lumber, may well be expected.

Forestry Division, Washington, D. C. *B. E. Fernow.*

Foreign Correspondence.

Bamboos in English Gardens.

DURING the last six or eight years considerable attention has been given by certain English and French horticulturists to the Bamboos that are sufficiently hardy to be cultivated out-of-doors in the warmer parts of the kingdom. Previous to this period Bamboos were practically unknown as ornamental plants for the garden, the only species grown generally being the plant then known as Bambusa Metake, while Arundinaria Falconeri, often erroneously called A. falcata, was cultivated in a few gardens where the conditions were exceptionally favorable. In 1866, Colonel Munro prepared a monograph of *Bambusaceæ*, and in his introductory remarks he stated that "a large number of Bamboos are now in cultivation, and, perhaps, twenty species at Kew alone. I am informed there are at least fifty in Paris. Few of these, perhaps of Arundinaria only, are hardy in England, or even in the warmer parts of Ireland." There has been a collection of hardy Bamboos at Kew for at least twenty years, and, according to a letter from the late Canon Ellacombe to Sir Joseph Hooker in 1879, he had then in his garden at Topsham, near Exeter, "flourishing most vigorously, a collection of twenty Bambusæ, all named by General Munro." Nothing, however, appears to have been done to prove the value of Bamboos for the outdoor garden until Kew, Mr. Mitford and Sir E. Loder took the matter in hand. The Kew collection was formed partly by purchase from the Japanese nurserymen, from Monsieur Marliac, of Temple-sur-Lot, and from the collection formed by the late Monsieur Lavallée at Chateau du Segrez, near Paris. A garden was made specially for them in a sheltered, picturesque position, and the collection, consisting of about forty sorts, was set out in groups and masses. At the same time Mr. Mitford had decided to make a feature of hardy Bamboos in his lovely garden at Batsford, near Stratford-on-Avon. He has always taken an interest in Kew, partly from his love of plants and also from his having held for some years the position of secretary to the minister in whose department the Royal Gardens are. Probably the collections at Kew and Batsford are equally rich in number of species and varieties of Bamboo, and the success met with in their cultivation in these two gardens appears to be on fairly equal lines. Mr. Mitford has utilized the resources of Kew in naming and working out the history, cultural requirements, etc., of Bamboos in a most interesting book,* in which he states that the task of preparing it has not been an easy one, and would have been impossible but for the kindly help and encouragement which he received from Sir Joseph Hooker, Mr. Thiselton Dyer and several members of the Kew staff. The outcome of Mr. Mitford's thoroughness and perseverance in working up material for his book is a work of considerable value, both to botanists and horticulturists. It embraces all that is known of all the hardy Bamboos in cultivation in England; consequently it will be accepted as the recognized authority on all matters appertaining to these plants for some years at any rate.

The book is divided into chapters which treat upon the formation of the Bamboo garden and the positions and best time of planting for the plants; their propagation; the uses of and customs and superstitions connected with Bamboos; their classification according to easily recognized characters of habit, culm, leaf, sheath, etc.; description and history of each species; the future possibilities of these "Royal Grasses"; a plea for Bamboos ("Apologia pro Bambusis meis"), and a list of the Japanese names of Bamboos, with their botanical equivalents.

Mr. Mitford is preëminently qualified to write about Japanese Bamboos from his having resided for some years in Japan. He is the author of *Tales of Old Japan*, described as "pictures of Japanese life and manners not worked out in the monotony of minute detail, but dashed in with bold, telling touches." His Bamboo book may be described as a happy combination of scientific accuracy, reliable practical directions, and a skillful, charming style. Even the descriptions of the species are drawn up in such a way as to interest even readers who know nothing of Bamboos.

Mr. Mitford, while modestly calling his book a descriptive list, claims an attraction for it "in the admirable drawings furnished by Mr. Alfred Parsons." I confess to a feeling of disappointment with regard to these drawings. They may be art, but they are of no value either to the gardener or botanist. Photographs of representative plants would have been more acceptable.

The number of species described in the book as having proved hardy at Batsford and Kew is forty-five. Of this number thirty-six are natives of China and Japan, one of the United States, five of the Himalayas, the other three being of doubtful habitat. These are all distinct and not difficult to recognize after a little practice. They present considerable variety in thickness and height of stem, size, color and form of leaf and in their manner of growth. Most of them grow with astonishing rapidity and are evergreen even through severe winters. The only drawback Bamboos have is in the somewhat shabby appearance assumed by some of the sorts in April and May, the result of the trials of winter. Against this, however, may be pitted the perfectly healthy appearance they wear throughout the autumn and winter, when most plants are looking their worst. There can be no doubt that Bamboos will add a considerable attraction to the garden, and as they are not particular as to soil, living and growing in gravel, or even sand, if only they can obtain a good supply of moisture, they are available for all gardens where the climate is not too severe for them. At the same time they well repay liberal treatment in regard to soil and manure. All the species described by Mr. Mitford "have stood through four winters and twenty-six degrees of frost, and they have resisted an even more deadly enemy than frost in the droughts of 1892, 1893 and 1895. . . . As for Phyllostachys nigra, nigno-punctata, Boryana, Henonis and viridi-glaucescens, they simply laughed at the thermometer, and were as bright at the end of the winter as at midsummer."

The following extract may be taken as a sample of the style of the author; it is also interesting as a description of his own garden at Batsford, one of the most charming, most informal and, at the same time, richest in grand effects to be seen in England:

As I write I look out upon a great rolling track of park-land studded with patriarchal Oaks that were saplings in Plantagenet and Tudor days, giant Ashes, Elms and Thorns planted in the reign of good Queen Anne. Far be it from me to introduce any change into such a scene. It is thoroughly English and perfect of its kind; no impious hand should dare to tamper with it. But farther up the hill there is a spot snugly screened from the cruel blasts which come from north and east, where, when the great Oaks and Elms, shorn of their summer bravery, are mere gaunt skeletons, there is still some shelter and some warmth. Here, amid the sparkling glitter of a Holly grove, are all manner of beautiful evergreens, rare Pines, steepling Fir-trees, Rhododendrons, Cypresses, Junipers. A tiny rill trickles over the green velvet of the rocks, with Ferns peeping out of crannies in which many an alpine treasure is hushed to rest, waiting the warm kiss of spring and the song of the birds, that, like Orpheus with his lute, shall raise the seeming dead from the grave. Tall Rushes and gracefully arching Bamboos, hardly stirred by the wind, nod their plumes over a little stream from which the rays of a December sun have just strength enough to charm the diamonds and rubies and sapphires; a golden pheasant, all unconscious of a human presence, is preening his radiant feathers by the water-side. It is a

* *The Bamboo Garden*, by A. B. Freeman Mitford, C.B. Macmillan & Co. Price, 10s. 6d.

retreat such as the fairies might haunt, and where in the bitter Christmastide a man may forget the outside world, and for one too brief hour revel in a midwinter day-dream of glorious summer.

There is much thoughtful writing upon gardening in general, as well as upon Bamboos in particular, in Mr. Mitford's book which is certain to rank with the very best books of horticultural literature.

London. *W. Watson.*

Cultural Department.

The Hubbard Squash and How to Grow It.

WHEN we consider the great improvement that has been made in the quality of almost all garden vegetables during the last half century, it is a remarkable fact that the Hubbard Squash, known and cultivated nearly a hundred years ago, continues to be the most popular variety. There has been improvement in uniformity of form and color, and last fall careful inspection of a forty-acre field, grown for seed, failed to discover more than twenty-five fruits which showed any signs of mixture or of being off type. But, while the stock has evidently become more fixed in external character, there are those who maintain that it has deteriorated in the quality of flesh; that the rich, dry, sweet, chestnut-like quality which made this sort so popular fifty years ago is lost. I think this apparent loss is due to other causes than the deterioration of the stock. There are no plants of our gardens in which the quality of the fruit is so dependent upon conditions of soil and climate. Gardeners know that it is quite impossible to grow a really good Melon in cold, wet soil, and that one ripened in a cold, damp atmosphere is certain to be lacking in flavor and sweetness. The same thing is true of squashes, and to develop the nut-like dryness and sweetness they must be grown in warm, dry soil and thoroughly ripened in warm dry weather. Unlike most plants of the garden they will produce more fruit and of a better quality on plants of moderate vigor of growth than on those of rapid and rank growth. Again, Squashes, like Beans, are more benefited by applications of potash and phosphoric acid, but are unlike the legumes in seeming to get much good from these elements when in a comparatively slowly soluble form.

To grow good table squashes, then, warm, dry, moderately rich soil should be selected and cultivation be begun as early in spring as possible. A liberal dressing of wood ashes is necessary, a full bushel to the square rod being as little as should be used. Just before planting, which we do about the 20th of May, the ground should be plowed and harrowed and marked out for hills about ten feet apart each way. At the intersections a handful of guano, hen-manure or superphosphate should be scattered, and also one of fine ground bone-dust or flour. Thoroughly mix this with the soil for a space two feet in diameter and plant from twelve to twenty seeds, scattering them well, as in this way one or two plants can often be saved from cutworms and striped bugs, which would have destroyed all if the plants had been close together. We do not know of any certain protection against the striped bug. Dusting with wood ashes, with lime fresh slacked, with a little sulphur, sprinkling with dilute gas-tar water, or with liquid manure made from fresh hen-droppings, are each more or less effective and will sometimes seem to keep the insects off, but at others utterly fail to do so. My advice is to use any or all of them. The lime and ashes should be diluted with bran and plaster, or, better still, with tobacco dust; if used abundantly there is danger of killing the leaves with strong alkalies. As soon as the large squash bugs appear they should be trapped under pieces of board or shingle laid near the plants and examined in the cool of the evening when the bugs will be found hiding on the under side and can be easily caught and killed. Give as little cultivation as possible, only enough to keep the ground clear of weeds, and the surface broken after heavy rains. When the plants are well started thin out, leaving two or three to each hill, and when these are three to four feet long remove the surface soil under a joint twelve to eighteen inches from the root. Press the vine down into it and fasten it, so that the stem will arch up between this point and the root and cover with earth. If the soil is at all dry water thoroughly, covering the wet surface with dry earth. The vine will make root from the buried joint, and in this way it will often escape death from the borer working at the collar.

In spite of all claims to the contrary, I am certain that the quality of squashes is often affected by the fertilization of the flowers with pollen from some inferior stock. In garden culture it is quite feasible to prevent this by going over the patch at evening and preventing the female flower, which would naturally open the next morning, from doing so by tying the tip of the blossom, and treating a few male flowers in the same way. About nine o'clock the next morning pick the male flowers; carefully tear away the corolla and fertilize the opened female flowers by dusting or rubbing some of the pollen from the male flower over the pistil, then closing and retying the female flower. While there will be failure to accomplish the purpose in some cases, enough self-fertilized fruits can easily be secured for a full crop, and any others which may appear can be cut out. As the fruits mature they should be protected from the sun unless they are well shaded by the leaves. When fully ripe, which may be known by their developing a shell so hard as not to be easily penetrated by the thumb-nail and by the part resting on the ground turning to a rich yellow, they should be gathered and stored in an open building until there is danger of freezing. In gathering, care should be taken not to break the stem of the fruit, the vine being cut instead, and also not to injure the surface.

Grown and treated in this way the Hubbard Squash will be found to have all its old-time excellence. The causes of inferior quality are that it is grown in too rich and wet soil; late sowing, so that it does not mature until cold wet weather sets in; and leaving the fruits on the vines exposed to injury from hot sun and cold nights after maturity.

Detroit, Mich. *Will W. Tracy.*

The Rock Garden.

THE rock garden grows in interest every day as one after another the plants come into bloom. In looking it over this season we find an unusual number of self-sown seedlings. Many of these are in themselves desirable plants, but their number must be reduced or they would make a weedy effect. Campanula Pallasii needs thinning out. It is a handsome biennial, and effective when properly placed. Here it borders a natural shrubbery, and being aggressive takes possession of the ground beyond the limits allotted to it. When it extends into the shrubbery, along with some Sunflowers, Helianthus lævis, we do not object, but outside these limits it must be weeded out. Papaver nudicaule comes up everywhere, but it is so graceful that we let it grow quite freely. It is short-lived, and hundreds of the plants die every year. There are plants in all stages of growth—some in bloom now, and seedlings to bloom in the autumn. Some hybridization has been effected with the P. alpinum form, so that now we have white and several shades of orange, and some have become double. A double Iceland Poppy is not, however, to be regarded as an acquisition.

Viola cucullata is taking up too much space. In spring-time it is a hard matter to root the numerous tufts of attractive purple and white flowers. Gray's *Manual* says of this Viola, "flowers rarely white." All our plants were originally the variety cucullata, var. striata, and it was with pleasure some five years ago that we found a pure white-flowered variety among them. Now it has spread to all parts of the rock garden, to the exclusion of the purple form, which will need artificial propagation. Saponaria ocymoides, formerly of the variety splendens, has so far retrograded that it is now a weed. The beautiful Heuchera sanguinea fails to come true from seed, freely hybridizing with the commoner H. Americana. Aquilegia Canadensis seems to have improved by contact, probably with some of the early-blooming cœrulea hybrids. We have some purple ones among them, but it is hardly probable they are hybrids with A. glandulosa or A. Bertoloni, A. Olympica possibly. Alyssum Wiersbeckii has spread itself agreeably. It is the brightest and best of all. Its long-branched spikes of bright yellow flowers are delicately fragrant and make a handsome bouquet in themselves. Tufts of Iris graminea, var. hæmatophylla, occur in pleasing contrast with the large Rock Cress, Arabis albida. Iris verna, with lavender and yellow crested flowers close to the ground, is really pretty, and is at the same time one of the few fragrant kinds. We were pleased to find an uncommonly pretty and scarce British scurvy grass, Cochlearia Anglica, come through the winter in good condition. It was the first plant to flower, excepting the Chionodoxas and Squills, and was nearly a week ahead of the Rock Cress. The flowers are pure white in dense tufts, looking neat for a while, but it will evidently, like many other plants of this character, look ragged later, and end itself in going to seed. The same happens with Iberis Tenoreana, one of the handsomest of rock Candytufts. It is also tender, and with lessened vitality in producing seed it seldom goes through the second winter. We secure it by taking a few cut-

tings. We are on safer ground with native plants. Mertensia Virginica takes care of itself, and is not likely to become obtrusive. Its life above ground is short, being past, leaf-stem and all, by midsummer. Its nodding panicles of incomparable blue are always welcome.

Phloxes of the subulata type are the most charming spring flowers we have. Their color tones are most penetrating; a patch six by six feet, of the old variety atropurpurea, will catch one's eye from a hillside half a mile away, while P. reptans, an equally handsome kind with colored flowers, will scarcely be noticeable at that distance. P. reptans grows nearly one foot high with us, and the stems are long enough to pick. P. subulata Sadie is an American-raised sport from the common white Moss Pink. It is lavender-blue and unique among the true subulata type. It is thrifty and early, always fresh and green, whereas many of the imported varieties get winter-burned.

Rosa Wichuraiana, the so-called Memorial Rose, is badly killed, but there are plenty of live shoots left to cover the ground anew. Megasea purpurascens and M. cordifolia have also suffered severely. They are naturally evergreen, and when their winter coat of leaves is lost new ones must be made at the expense of the old root. Under such conditions the Megaseas will be gone in a few years. Campanula garganica looks fresher than ever.

We have introduced strangers to our rock garden who expected to see statuary and fountains, and others who thought we should arrange it in beds or tiers of pockets as more convenient to get at. The garden is wild and without labels, and is as natural-looking as any other bit of bank. It is hard, however, to get the names grounded into one's memory, and fresh additions every year increase the difficulty. Apart from the rock garden proper we have a piece of wild garden along a sheltered slope. It is in part shaded by sparsely planted Oaks, and grassed over to be kept green, but not to the extent of a trim lawn. Many beautiful plants can be introduced here. Native plants and such as could be mown over with a scythe without injury are desirable. There are enough to make a lovely spring picture. Blood-root, Sanguinaria Canadensis, Mertensia Virginica, all the Subulata Phloxes, Violas, Aquilegia Canadensis, Silene Pennsylvanica, S. Virginica, Anemone nemerosa, A. deltoidea, A. ranunculoides, Erythroniums, Thalictrum anemonioides, Claytonia Virginica, Trilliums of several kinds, Mularias, Hypoxis, Bluets, Decentra Canadensis and many others should be included.

Wellesley, Mass. *T. D. Hatfield.*

Notes from the Arnold Arboretum.

PLANTS of Amelanchier oligocarpa which were obtained from the mountains of New Hampshire are the earliest of the Shad-bushes to flower here, and they are really among the most pleasing of dwarf American shrubs. In its native habitat this Amelanchier is rarely more than a foot high, and when grown carefully on good soil it does not exceed two feet in height. The young leaves as they open are tinted red, something like those of the large forms of A. Canadensis. The bark when bruised has the peculiar odor of the Wild Cherry, which I have not observed in any other species or variety of Amelanchier. Another fine Amelanchier is called, I believe, a variety of A. Canadensis, and known as spicata, and sometimes rotundifolia. If not a good botanical species, it is certainly a very distinct plant for garden purposes. It comes into bloom late, and is just now, May 12th, in its prime, when the others are all past their bloom. As grown here it is a low dense shrub, which produces snow-white flowers very freely.

Nurserymen who are looking for new things would do well to get a stock of these on their own roots, or if they would graft them from two to four feet high on some good Thorns they would set plants which would be genuine novelties for the shrubbery. Some of the low-growing Prunuses, too, ought to be looked after. P. pumila, which rarely in its native state exceeds a foot high, although it becomes larger under cultivation, is a beautiful plant on its own roots, and so are P. maritima and P. Alleghensis, but if they were grafted as standards on P. Americana or P. Myrobalana they would make neat, compact-headed plants, which certainly would be novel, and, no doubt, useful in shrubberies. P. incana is the most ungainly in habit of any plant in the whole family, and yet, if it could be in any way made into a shapely plant, its pinkish purple blossoms, which come in clusters, would be greatly admired. The first of the Apple-trees to come into bloom are the varieties of Pyrus baccata, with blossoms of all colors, from pure white to deep crimson. Among the newer forms of P. spectabilis the variety Riversi is strikingly beautiful this year. It is completely covered with its sweet-scented, double, rose-pink flowers. The habit of this spectabilis group may also be called fastigiate, as compared with the generality of Apples, and they do not begin to flower as early in age as some of the other kinds of Apples, but they make up for this by persistent flowering afterward, for there is seldom a year when they do not bloom profusely.

Complaints are made that Daphne cneorum is doubtfully hardy, and it is true its foliage often burns in exposed situations in winter-time, but if the plants in autumn are furnished with a scanty covering of hay or dry leaves the foliage will keep bright all winter and they will come into blossom in early spring. The delicately scented pink flowers of this prostrate plant have been abundant here for a week or more. The Redbuds, as usual, opened with the flowering Dogwoods, and it cannot be too often said what a fine forest border or background to a shrubbery these two trees make at this season. One of our native Honeysuckles, Lonicera cœrulea, is just coming into flower. It is a neat and pretty shrub, not only on account of its lemon-colored flowers, but on account of its good foliage and the bright blue berries which follow. Just now the Rhodora is in its prime, and it is to be regretted that so good a dwarf shrub should be so neglected in landscape work. It certainly would fill an admirable place in connection with the Andromedas and Leucothoës when planted near the water. Perhaps it is youthful associations which make these plants so pleasing, but every boy brought up in the north where there was a peat meadow must know these flowers, and his memory will be stirred by sight of them.

Arnold Arboretum. *Jackson Dawson.*

Flower Garden Notes.

THIS is one of the most interesting parts of the year in the garden, even with the extreme heat and dryness of this particular season. April showers have this year been very rare and are sadly needed.

The show of Apple-blossoms at this time is the feature of the country where apples are grown in quantity, and as a flowering tree alone it has few equals. The flowering Crabs are, perhaps, quite as pleasing, with more variation of coloring, and for this reason are finding favor with planters. There is a set of some ten kinds in flower here. They are beautiful planted in a large crescent-shaped bed, the ground being covered with late-flowering Tulips, the Parrot, Gesneriana and Darwin varieties mixed. The combination of Tulips is extremely beautiful now, when the early border kinds are all past. A little later the Oriental Poppies that are planted between will come on and give a second display, and when the Tulips are dying down Zinnias will be planted over them for a late summer effect. We thus get four distinct displays from the same bed with only the annual planting of the Zinnias. This plan is, perhaps, adapted only to beds of large size, so that there is a mass of color in its season.

Lily-of-the-valley is now in full bloom, much earlier than usual, owing to the heat, but the flowers are not so fine as in some years, because of the lack of water. If care is taken to thin them out every three years or so it is surprising how much better they will grow than those forced under glass in winter, provided the best variety of crowns are planted, such as are used for culture under glass.

Hardy Primroses are not esteemed very highly, and it is a question if there are any species that are to be regarded as proof against the severity of our winters. With a little protection some will prove very satisfactory at this season. A few hundred of the garden Polyanthus, raised from seeds a year ago and grown all last summer in shade under the Elm-trees, are a beautiful show at present. All the gradations of color in yellows and reds, mixed together with none that clash, make a very pleasing effect in a shaded position. Last fall, just before frost-time, a covering of straw about six inches thick was placed over these plants and removed early this spring. This is all the care taken, besides seeing that plenty of moisture was provided during the growing period. Primula Sieboldii, the Japan Primrose, is now at its best, treated in the same way. We find this useful for cutting, the erect stiff stems being better than those of the Polyanthus when grown under the same conditions. It is deserving of much wider cultivation. I do not remember to have seen it elsewhere, and it is usually regarded as a tender spring-flowering plant, but is hardy enough to stand out over winter, with covering. The typical P. Sieboldii is a rich, deep rosy purple color and is the best variety to grow, though there are numerous other kinds, some called white. But there is not the purity of color one would expect, and the same remark applies to the many other varieties of P. Sieboldii in commerce, the type being still in

advance of the "improved" varieties. There is also a set of double Primroses, common in English gardens, the colors varying from rich deep red to lavender, yellow and pure white. We have never been able to get the red-flowering sort, but we have the other colors and grow them in quantities in frames for early spring flowers, treating them the same as Violets. They have proved as hardy as the Polyanthus during the past winter and quite as satisfactory in the open border, under the same treatment. These are true Primroses, having one flower only on each stem, this being the point in which they differ from the Polyanthus or many-flowered Primrose.

All the yellow-flowered Narcissus are past, and we have only the Poet's varieties left, but these are very beautiful now, planted in the grass under Apple-trees in an orchard. This is the proper place for the stellate-flowered kinds, without doubt. Not only are the rich borders unfitted to them, but the flowers to be seen at their best need a green setting such as the grass affords, and under trees the grass is thin and is allowed to grow until hay-time, when the Narcissus have about matured their foliage, and may be cut off without injury to the bulbs. All of the Poeticus section, also Barrii, Leedsii and incomparabilis are eminently adapted to this mode of culture, and I am not sure that some of the large yellow Trumpet kinds would not do better under this system, but this is a matter for further trial. Some Narcissi dwindle away and some thrive in rich soil. Those that disappear probably have good reason for doing so, and it is fair to assume that, provided they are hardy, it must be from uncongenial soil.

Mertensia Virginica has been beautiful for two weeks past, and is still as blue as the Myosotis. It is one of the best spring flowers we have, and as a companion for it may be recommended Corydalis nobilis, the noble Fumitory, a near relative to the Dicentras, with foliage similarly cut, and large clusters of flowers of bright yellow, with dark brown centres. It is a difficult plant to transplant, owing to the nature of the root-stock. Any one who has moved roots of the old Bleeding-heart will remember the half-decayed state of the thickened roots, and the same peculiarity applies to Corydalis nobilis, so much so that it takes a year or two for the plants to fully recover from a removal. But it is a valuable plant for spring blooming and a fitting companion for Dicentra eximia, the best form of this being now in full bloom. It is one of the best native plants we have for the open border, though it comes from Tennessee and Georgia.

Trollius Europæus and T. Asiaticus have proved so well adapted to this climate that a trial of the other cultivated sorts has been made, and a complete set of those grown in European gardens were obtained last year. These are now in bloom, with the exception of T. patulus and its white variety, the plants of which did not live. The double T. Japonicus is a real gain, owing to the brilliance of its orange-yellow color, and so is T. napellifolius, which is a fine large flower, but the improved garden forms sent are no better than those raised here from seed of T. Europæus and T. Asiaticus, and are not so well suited to our climate. It is desirable when a good form from seedling plants appears in the garden to save seed from it. Plants raised in this way often have exceptional value, and some of the best globe flowers we now have we secured by this means.

Pæonia Wittmanniana is now in flower. It comes in before P. tenuifolia, and has single cup-shaped creamy white flowers, with abundant yellow anthers and traces of purple at the base of the cup. It is interesting as a species, and also on account of its early flowering season. P. tenuifolia will be in bloom in a day or two, and there are few more desirable garden plants than the early-flowering Pæonies, including the tree varieties, and they come at a season when there are no rosebugs to devour them.

South Lancaster, Mass. *E. O. Orpet.*

Carex Japonica variegata.—This is one of the most elegant of the dwarf Grasses and is perfectly hardy in this latitude. The narrow leaves are twelve to eighteen inches long and deeply channeled, and vary in color from nearly pure white on poor soil to those with interlinings of white and green on more generous nourishment. It flowers in April or May on triangular stems, which are long and pendulous and scatter the abundant golden pollen in every breeze. But the plant increases rapidly by underground shoots. It is especially desirable for a front row in the border, and would be very attractive in a greenhouse if grown in shallow pots for decorations.

Allium Margaritanicum.—This is a rather uncommon Onion from Asia Minor, which is a distinct and hardy species well suited to the rockery. Its rounded leaves are about six inches high and the flowers are clustered in a globe of about an inch diameter, forming a hairy-like white ball. Like all the hardy Alliums this species seeds freely and will maintain itself under adverse conditions.

Elizabeth, N. J. *J. N. G.*

Correspondence.

Why do Blossom-buds Winter-kill?

To the Editor of GARDEN AND FOREST:

Sir,—In your issue of May 6th, Mr. Willard is quoted in a note as saying that the failure of the plum crop proves that the fruit cannot endure a temperature of twenty-two degrees below zero. Mr. Willard has had more experience than I, but it seems to me that he is only considering one of the factors in hardiness of plants. The fact that fruit does not endure a certain degree of cold one winter is no proof that it may not endure even a lower degree under different conditions.

Here, we ordinarily think of fourteen or fifteen degrees below zero as fatal to the peach crop, and as we often have a lower temperature than that but few Peaches are planted. During the winter of 1894-5 the thermometer several times ranged below twenty, and once sank to twenty-five below zero, and yet only half the Peach-buds were killed, and the trees produced a good crop the season following. Last winter, with a minimum temperature of only five degrees below zero, fully one-third of the Peach-buds were killed. I do not know just what conditions made the buds more hardy one season than another, neither do I know why part of the buds on a tree should be more hardy than the rest. Even in the axil of the same leaf one bud may be killed and the other live.

Other organic substances show the same differences. In a half-bushel basket of potatoes exposed to the cold in a cellar, I have often found frozen tubers scattered through the basket and the rest not frozen. In the blossom-buds of the Cherry and Plum one or more may often be found killed, while the rest have escaped.

When we first began to spray our Peach-trees to prevent the fruit from rotting, the Bordeaux mixture used was not properly prepared, and as a consequence a large part of the leaves on the sprayed trees fell off prematurely. The next spring it was found that there was a larger proportion of live buds on the trees from which the leaves had fallen than on the rest of the same variety. My explanation at the time was that the buds become less hardy in proportion as they are more developed. We know this is true in the spring. The question at once arises, at what stage in the development of a bud is it the most hardy, and how can we best control that development? This seems to me a promising field for some careful study.

Illinois Agricultural Experiment Station. *G. W. McCluet.*

A Destructive Scale in the Marquesas Islands.

To the Editor of GARDEN AND FOREST:

Sir,—Mr. Craw sends me part of a Cocoanut-leaf and a leaf of some tree called "Vee," from the Marquesas Islands, thickly infested by a scale insect. He received the specimens from Mr. J. Wilkinson, of Tanata, who reported the insect as very destructive, remarking that "it breeds faster and attends to business better than anything else in our little world." The scale proves to be the Aspidiotus destructor of Signoret, described in 1869 from specimens received from the island of Bourbon, where it was very destructive to Cocoanut Palms, and also infested Guava and other plants. In 1891 Maskell recorded it on Cocoanut in the Laccadive Islands, and I have shown that it is common in the West Indies. Mr. Wilkinson thought it had reached the Marquesas from California or New Zealand, but it is not known in either of these localities. Care should be taken that it is not introduced into southern California or Florida.

Agric'l Experiment Station, New Mexico. *T. D. A. Cockerell.*

Recent Publications.

The second part of the botanical series of the publications of the Columbian Museum of Chicago contains an account of the plants of West Virginia, by C. F. Millspaugh, curator of the Department of Botany, and Lawrence W. Nuttall, prefaced by a short account of the topographical and climatic features of the state, its botanical history and an account of the special features of the flora. Two thousand five hundred and eighty-four species, varieties and forms of plants have been detected in the state, including more than a thousand species of Fungi and Lichens, and

1,309 species of flowering plants. It is claimed that West Virginia contains a greater amount of hard-wood timber in its forests than any other state, and the authors are convinced that "nearly or quite two-thirds of the state remains uncleared, and by far the greater portion of the uncleared land is still in virgin forests, where the axe of man has never found its way, and where magnificent specimens of forest growth stand thickly side by side and reach a towering height, no finer view of standing timber may be had within the confines of the Union. These splendid forests, covering over sixteen thousand square miles, yield nearly every species found in the north. Here trees grow to such size that ordinary methods will not suffice to handle them, and are frequently so densely compact that the light of day scarce penetrates their shade, and pathways must be cut before the axemen can find room to work." Among the principal timber-trees enumerated are the White Ash, the Beech, the Black and Yellow Birch, the Lindens, the Chestnut, Wild Cherry, the Hemlock, the Hickory, the Sugar Maple, the White and Chestnut Oaks, the White Pine, the Red Spruce, the Tulip-tree and the Black Walnut.

Notes.

More than ten thousand cases of apples reached the London market on a single steamer on the second of May from Tasmania. Permains and Ribston Pippins were reported of the first quality and evenly graded, and brought at wholesale from $2.50 to $3.25 a bushel, and a small quantity from Victoria brought $4.50.

New potatoes are coming from as far north as Georgia and South Carolina, as are cabbage, string-beans, beets and carrots. New beets are also coming from Louisiana, and the first peppers of the season from that state arrived last Saturday. Peas from Maryland are in the markets, the bulk of supplies of this vegetable coming from Virginia. Cucumbers, from glass houses near Savannah and Charleston, are offered with field-grown stock from Florida. From near-by points, grown under glass and in the open, are new onions, lettuce, cauliflower, beets, sorrel, dandelion, kale, spinach, rhubarb and radishes.

Huckleberries of good quality, from North Carolina, may be had in this city for thirty cents a quart. The first blackberries, from the same state, were offered here two weeks ago, but these were small and not desirable. The first Peento peaches from Florida reached New York last Saturday and are now selling at retail for $1.50 a dozen, the price asked also for Bidwell peaches. While strawberries have been plentiful enough, those of prime quality are scarce, owing to continued dry weather. This fruit is now coming from as far north as Maryland, and Delaware berries are looked for in a few days.

We learn from Thomas H. Kearney, Jr., of the Division of Agrostology, in the Department of Agriculture, Washington, that Buckleya distichophylla has been collected by Master Harry Allen, near Newport, Cocke County, Tennessee, about sixteen miles below Wolf Creek, so that its known habitat is greatly extended. It will be remembered that Buckleya is one of the rarest of North American shrubs. It was described and figured in this journal, vol. iii., page 236, and on page 168 of the present year Mr. Kearney gave an interesting account of its discovery at several points near Paint Rock, which for many years was considered the only place where it was found in a natural state.

A protracted drought so early in the year as this is phenomenal, but all the country hereabout is now suffering for lack of water. When pasture-fields in the middle of May look as brown as they do in August, and there is no grass growing in the meadows, and even the Plantain leaves are curling up on the lawn, the outlook for the farm and garden is not promising. The extreme hot weather forced flowering plants into bloom earlier than usual, but the flowers came all at once when they should have been spread over at least a fortnight. A forced growth is always feeble and the flowers lasted but a little while. The season of Tulips and Daffodils was never so short. Meanwhile, vegetable seeds lying in the ground, which is almost dust-dry, show no signs of germination. These droughts, which now seem to come every year at one season or another, are so destructive that no garden is safe without some appliance for irrigation.

A correspondent in writing of the Flower Carnival in San José, California, which was one of the earliest towns in the northern part of that state to revive the old Spanish custom, says that the town was filled from the sixth of May to the ninth with great crowds from every direction. More than one hundred acres of flowers had been planted in vacant lots about the town and cared for by the organization which prepared the pageant, and, besides these, car-loads of material were brought in from other places, and the entire Santa Clara valley was laid under contribution for flowers used to decorate the innumerable floats and vehicles which made up the grand parade or to be strewn about lavishly in this Battle of the Roses. The streets were decorated with arches and the houses with flowers and boughs of Douglas Spruce and Redwood, while the gray moss which streams from the White Oaks was largely used in mural decorations. The procession was three miles long, and some of the floats were considered wonders of art. Among the leading participants were the school children from the city and other points in the valley, each school competing for a prize for the most beautiful and original design.

A bulletin lately issued by the Agricultural Experiment Station of Pennsylvania gives an account of the phosphate deposits in Juniata County which were discovered last year. It has long been known that there was a narrow belt of unusually fertile soil along the two central ridges of this county, and it was in this belt that the discovery was made. Along the outcrop of the Oriskany sandstone, between this and the overlying Onondaga limestone, is a decomposed mass of marls and sands in which the phosphate material is found. The seams lie conformably with the stratification of the country and can be easily traced. Trenches give evidence of a persistent belt of phosphate which can be easily mined, is accessible to railroad, and encloses valuable material enough to constitute an industry. The material is not of a grade equal to that of the southern phosphate, but it will bear transportation to a moderate distance. What renders the discovery of special interest, however, is the fact that almost exactly similar geological conditions exist in many parts of the state, so that there is warrant for the belief that further explorations may develop phosphate deposits in various parts of the commonwealth, and if so this may result in an important addition to the agricultural resources of the state.

In regard to the sale of American apples in England, Messrs. J. C. Houghton & Co., of Liverpool, who deal in high-grade apples at wholesale, write that early in the season fine King apples always sell well, and last year they brought as high as $5.62½ a barrel, although this fruit generally ranges at wholesale at from $4.00 to $5.00. As the season advances King apples become softer, and Baldwins, which are always appreciated in the English market, take their place, in a measure, at prices of from $3.00 to $4.25. Greenings are usually in good demand for culinary purposes, but not being used for dessert do not command the prices paid for more attractive-looking red apples. York Imperials last year were in high favor, and sound large fruit brought from $4.25 to $5.63 a barrel. Ben Davis, Winesap and Spitzenberg are all well known and appreciated, and bring about the same prices as Baldwins. Golden Russets usually sell for low prices while other apples are coming forward freely, but in the spring, when most varieties are exhausted, they frequently command full prices, and sales have been recently made at from $4.25 to $5 40 a barrel. Newtown and Albemarle Pippins are regarded there as the very best American apples, and during last season they brought at auction as much as $8.37, but when arrivals were heavy, prices ruled at from $3.75 to $5.25. Of course, these prices apply to selected fruit, for small and inferior Albemarle and Newtown Pippins bring less than other varieties. In fact, it is hardly worth while for Americans to export small apples to compete with those from the European continent and English orchards. Where the Americans have the advantage is in the size and color of their fruit and in the convenient form in which it is packed—that is, in barrels. Only the larger and best-colored apples of any variety should be sent if good prices are to be assured.

The death is announced of the Abbé Delavay, for many years a missionary in Yun-nan, the south-western province of China, where he made large collections of plants, discovering in one small region more undescribed species than have fallen to any other one botanical collector of this generation. Among the plants discovered and introduced into Europe by him are numerous species of Primula, Rhododendron and other plants destined to keep green the memory of this brave, zealous and indefatigable priest.